

The Titan Posthole force balance triaxial accelerometer is ideally suited for national networks and research applications requiring reliable and durable instrumentation for strong motion and free-field studies. The accelerometer is housed in a waterproof stainless steel enclosure and can be deployed in a direct burial posthole or cased borehole, which enables co-location with broadband posthole seismometers.



**Titan Posthole**

The Titan Posthole features industry leading dynamic range that, when combined with ultra-low self-noise performance, mitigates cultural noise resulting in precise measurements and high quality data.

It is the first accelerometer to incorporate software selectable full scale range and offset zeroing capabilities. Operators will also appreciate the instrument's low power consumption, making the Titan Posthole the instrument of choice for difficult to access or remote deployments, where site visits should be minimized.

#### **Industry Leading Performance Attributes**

- Industry leading 166 dB dynamic range
- Ultra-low self-noise comparable to some broadband seismometers
- Wide operational frequency range: DC to 430 Hz
- Best in class thermal stability and high accuracy provide increased data quality
- Full scale range of  $\pm 0.125$  g to  $\pm 4$  g with independent horizontal and vertical range selection

#### **Ease of Use**

- Electronically selectable full scale range facilitates remote sensor control when deployments are distant or difficult to access
- Integrated web server provides efficient instrument management and control

## Accelerometer Technology and Performance

|                               |  |
|-------------------------------|--|
|                               | Triaxial, horizontal-vertical  |
| <b>Topology</b>               |  |
| <b>Feedback</b>               | Force balance with capacitive displacement                                       |
| <b>Full Scale Range</b>       | Electronically selectable range: $\pm 4 g$ , $\pm 2 g$ , $\pm 1 g$ , $\pm 0.5 g$ |
| <b>Centering</b>              | Electronic offset zeroing via user interface                                     |
| <b>Bandwidth</b>              | DC to 430 Hz (-3 dB point)   |
| <b>Dynamic Range</b>          | 166 dB @ 1 Hz over 1 Hz bandwidth<br>155 dB, 3 to 30 Hz                          |
| <b>(Integrated RMS)</b>       |  |
| <b>Offset</b>                 | Electronically zeroed to within $\pm 0.005 g$                                    |
| <b>Non-Linearity</b>          | < 0.015% total non-linearity   |
| <b>Hysteresis</b>             | < 0.005% of full scale   |
| <b>Cross-axis Sensitivity</b> | < 0.5% total   |

## Digital Command and Control Interface

|                                |   |
|--------------------------------|---|
| <b>Digital Interface</b>       | Horizontal sensor: 6000 baud, typical<br>Vertical sensor: 3200 baud, typical  |
| <b>Temperature Coefficient</b> | RS-232 compatible Serial Line Internet Protocol (SLIP)  |
| <b>Commands</b>                | R-232 command-line interface<br>Gain range selection<br>Auto-zero or set to specific offset<br>Self-test<br>Calibration enable<br>State of health request<br>Firmware updates |
| <b>Data Outputs</b>            | Sampled XYZ outputs (in volts and g)<br>Instrument temperature<br>Trimmer settings<br>Instrument serial number<br>Hardware assemblies and firmware revisions                  |

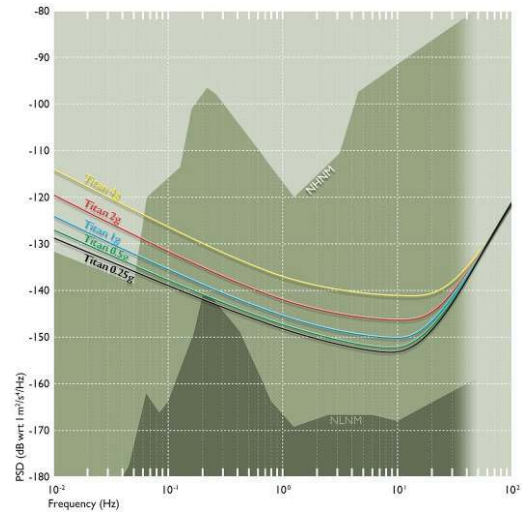
## Hardware Interface

|                            |  |
|----------------------------|--|
| <b>Connector</b>           | 16-pin, underwater SubConn MCBH16MSS<br>Captive cable shroud waterproof to 300m  |
| <b>Acceleration Output</b> | 40 Vpp differential  |
| <b>Output Impedance</b>    | 2 x 100 $\Omega$   |
| <b>Calibration Input</b>   | Single voltage input, all channels enabled together  |
| <b>Control Input</b>       | Single control signal can be configured to initiate auto-zero, initiate self-test, or enable calibration   |
| <b>Status Output</b>       | Asserted: Init OK, output signal valid<br>Deasserted: Self-test in progress or failed, auto-zeroing in progress, calibration enabled, or starting up |
| <b>Power Port</b>          | 9600 Baud RS-232 compatible  |
| <b>Supply Voltage</b>      | 9 to 36 V DC isolated input  |
| <b>Power Consumption</b>   | 1.1 W typical quiescent  |
| <b>Protection</b>          | Reverse-voltage and over-/under-voltage protected<br>Self-resetting over-current protection  |
| <b>Isolation</b>           | Supply power is isolated from signal ground  |

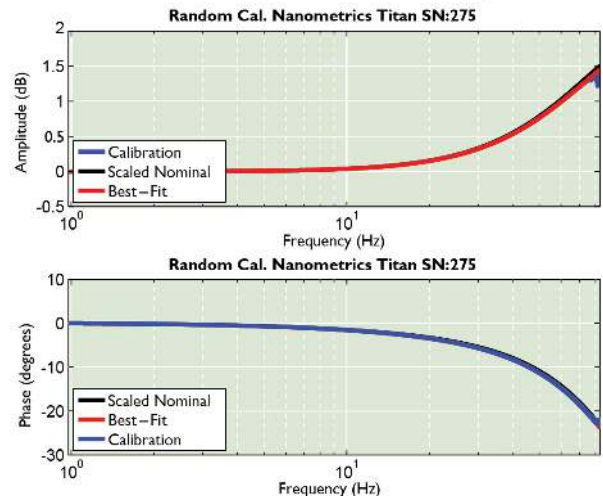
## Physical and Environmental

|                              |  |
|------------------------------|--|
| <b>Diameter</b>              | 97 mm  |
| <b>Height</b>                | 160 mm - body and connector  |
| <b>Weight</b>                | 3.3 kg   |
| <b>Operating Temperature</b> | -20°C to +60°C (Ultra-low temp. option available. Please contact Nanometrics.) |
| <b>Storage Temperature</b>   | -40°C to +70°C   |
| <b>Immersion Rating</b>      | 300 m continuous submersion  |
| <b>Weather Resistance</b>    | Rated to IP68 for full submersion  |

## Titan Accelerometer Self-Noise



## Sensor Performance: Flat Response



Test results courtesy of USGS

\*Specifications subject to change without notice.

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